

## Developing Collaborative Understanding

### Dialogue Games for Ontology Maturing

Communities of practice need to develop a collaborative understanding of their domain. The key idea of the approach is interweaving the development of a shared information repository and vocabulary (ontology) and dialogues about them. That means the CoP can collect and bookmark web resources around their area and build up a common multilingual vocabulary (ontology), which is used to organize the web resources by annotating them during the bookmarking process.

Structured dialogues, designed as dialogue games, are used to support the negotiations and development of a collaborative understanding of their domain; i.e. to discuss and refine the ontology; to critically discuss and assess the resources (e.g. reflecting and debating the correctness and quality). At the end, they provide a record of dialogue performance that is linked to the related resources and are accessible and searchable. In this way there is a continuous connection between resources, ontologies and dialogue processes within the CoP and developments are traceable.

### COLLECTING RESOURCES

#### Bookmarking and Annotation

Users can add semantically annotated web documents to the shared information space. For this they can use a bookmarklet within the browser or an annotate page within SOBOLEO. It opens a pop up window with URL and title already filled in based on the page that is open in the browser. For annotating the resource, the user can use any concept from the collaboratively developed ontology or arbitrary (multi-word) tags. New tags are automatically added to the ontology as „prototypical concepts“; users can consolidate and move them within the ontology later. This way we allow for the seamless gathering of new concept ideas when they are occurring. During the annotation the user is supported with auto completion of entities in the ontology to create awareness for and encourage users to reuse these. Additionally, the bookmarking and annotation tool allows the instant initiation of discussions about the web resource and/or its classification. When saving the bookmark and annotation, the system automatically fetches and indexes the contents of the page. The crawler is able to parse HTML, pdf and both the 2004 and 2007 MS Office formats.



When saving the bookmark and annotation, the web document annotation management service automatically sends out a crawler to fetch and index the contents of the page. The crawler is able to parse HTML, pdf and both the 2004 and 2007 MS Office formats.

### A SHARED VOCABULARY

#### Collaborative vocabulary construction

The ontology visualization and editing interface enables users to structure the concepts with hierarchical relations (broader and narrower) and to indicate that concepts are "related". Concepts can have a (multi-word) preferred label and a description in multiple languages; they can have any number of alternative and hidden labels (according to the SKOS format which allows us to seamlessly work with half-formalized domains and it is relatively easy to understand for non-modelling experts). The collaborative editor can be used by several users at the same time. Changes are immediately visible and effective to all users and the ontology's usage (e.g.

for search). The editor also provides the possibility to see performed dialogues related to a selected concept or start a new dialogue game.

## TOWARDS A SHARED UNDERSTANDING Assessing Web Documents and Negotiating Vocabulary

The InterLoc dialogue game tool enables users to participate in and contribute to structured discussions. Essentially, these dialogue games realise engaging and structured rule-based interactions that are performed using pre-defined dialogue features (such as dialogue Moves, Locution Openers and a model of turn-taking) that are specifically designed to foster thinking and learning in ways that are popular with users. All contributions or replies are made using Move categories (Inform, Question, Challenge, etc.) and scaffolded through using specific Locution Openers ("I think...", "I disagree because...", "Let me elaborate..." etc.) that have to be used to perform the dialogue. Similarly, rules about the legitimate and logical responding openers, based on the specific openers that are replied to, are offered selectively. We differentiate between critical discussion and reasoning dialogues and knowledge maturing dialogues, where the first one is specifically designed to support the discussion about a web document and its content and quality and the later one to discuss the vocabulary. The users can easily initiate a dialogue game from various points within SOBOLEO, e.g. during the bookmarking and annotating process, when editing the ontology, or browsing through the ontology and bookmarks. Performed dialogues are automatically linked to their related objects. For instance, when navigating to a concept in the browse area, the users can see a list of all

The screenshot shows the SOBOLEO website with a search bar containing 'aqueduct'. Below the search bar, it displays 'Results: 5 documents and 2 people found' and 'I understood that you searched for: aqueduct'. It lists search results for 'Pont du Gard - Wikipedia, the free encyclopedia' and 'LES AQUEDUCS ANTIQUES'. There are also profile cards for 'Miguel Amerigo' and 'Andreas Schmidt'.

performed dialogue games about this concept. The user can have a look at the dialogue's transcript by clicking on one of the listed dialogues. Thus, users may reconstruct the changes to those resources. If they do not share the opinion of others, they can also continue a dialogue game. When a user (re-)starts a dialogue, a message is sent to all running instances of InterLoc. The user who has started the discussion and all formerly participating users are asked for participation in this dialogue game. For all other users only the list of dialogue games will be refreshed, but they are free to participate.

### FACTS

#### Features

- Bookmarklet-based tagging widget with tag suggestions based on the existing shared vocabulary and the content of the resource page
- Lightweight, browser-based, and real-time collaborative ontology editor based on the SKOS formalism (synonyms, multilinguality, typos, broader, narrower, and related terms)
- Semantic search for resources, taking into account synonyms, broader and narrower terms, but also tag frequency
- Scaffolded dialogue games for reaching agreement about concepts and their relationships
- Traceable dialogue histories

#### Technology

The tool is based on the SOBOLEO framework (<http://www.soboleo.com>), a web-based application realized with the Google Web Toolkit. The data representation is based on SKOS in a RDF repository. It is open for integration through its Web Service interfaces (both SOAP and REST are supported).

The Dialogue games are based on InterLoc (<http://www.interloc.org>), which is open-source and based on XMPP.

#### Contact

FZI Research Center for Information Technologies  
Simone Braun  
Haid-und-Neu-Straße 10-14  
76131 Karlsruhe  
GERMANY

The screenshot shows the SOBOLEO interface for the concept 'aqueduct'. It includes a definition: 'a conduit that resembles a bridge but carries water over a valley'. Below this are sections for 'Broader Concepts', 'Narrower Concepts', and 'Related Concepts'. There are also sections for 'Newest Documents' and 'Interesting People'. A 'Performed Dialogs' section lists several dialogues. A 'Dialogue Area (Justfx)' window is open, showing a transcript of a dialogue between Justfx and Eduardo about the relationship between 'aqueduct' and 'Pont-du-Gard'.